Manitoba

Agriculture

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Disease Facts

Control of Plant Diseases in Home Grounds and Gardens

Disease Control

Plant diseases are a recurring problem in all home gardens. Their incidence varies from year to year. Generally, though, diseases are most serious when the growing season is too moist.

A plant disease is anything abnormal about a plant's growth and development. Sometimes the effect of the disease can be very severe and can cause plants to die. Such is the case with Dutch Elm Disease in American elms. On the other hand, the effect may be very slight and hardly noticeable, such as flower break of tulips caused by several types of viruses.

Plant diseases are caused by both living and non-living things. Some of the non-living causes of disease are:

- lack of essential nutrients for plant growth
- deficient or excessive moisture
- inadequate light
- temperatures either too high or too low.

Plant diseases caused by non-living factors can often be alleviated by adequate amounts of fertilizer, proper lighting and protection against temperature extremes. In the latter case, providing cover in case of frost or applying water to cool plants during high temperatures will help.

Understanding the growth requirements of the plants helps to provide the correct environment for optimum plant growth.

The other class of plant diseases are those caused by living things. These are primarily:

- fungi
- bacteria
- viruses

Other living organisms that occasionally cause plant diseases are parasitic plants, mycoplasma, slime moulds and nematodes. Often, optimum growing conditions for the plant will control the diseases caused both by non-living and living organisms. Unfortunately, good growing conditions do not always control all plant diseases.

Other ways of controlling plant diseases (specifically those caused by living organisms) are:

- using disease-resistant varieties of plants
- crop rotations
- eradication of diseased plants
- chemical control by pesticides.

The pesticides that control plant diseases are usually called fungicides. They are used to control plant diseases caused by fungi.

Like other pesticides, fungicides are classed commercial or domestic. Commercial fungicides are intended for use in controlling crop diseases. They are packaged only in large quantities, usually one kilogram (lb) or more. Domestic fungicides, registered for use by home gardeners, are packaged in small quantities. Some fungicides are classified as both commercial and domestic. However, a number of fungicides classified as commercial are considered not suitable for domestic usage.

The recommended uses of commonly available domestic fungicides for the home garden are presented in Table 1. The fungicides are listed by their accepted chemical name used in the list of ingredients appearing on the pesticide label.

Part A of Table 1 indicates the crop for which the fungicide can be used. Where there is a use, it is indicated either by a number (e.g., 1, 14 or 0) or by a solid dot●. Where there is no recommended use, the space is blank . The numbers indicate the recommended interval between the last date of application and the time produce can be harvested for safe use. For example, 14 days is the recommended interval for beans treated with benomyl. The solid dot ● indicates a usage on a non-edible crop or a seed treatment on an edible crop. In this case, the interval between the last spraying and harvest is not applicable. In some cases (for example, benomyl on strawberries), the fungicide can be applied even on the day of harvest. This is indicated by a O.

It is important that the correct amount of fungicide be applied. All safety precautions and limitations specified on the label must be followed carefully. Consult label for specific crop usages.

Fungicide Recommendations for the Home Garden

The number of fungicides available to the home gardener is always increasing. Therefore, choosing the correct fungicide for controlling specific disease problems is important. A list of the most commonly available domestic fungicides is outlined by chemical and trade names with brief descriptions of their uses. The fungicides are cross-referenced by chemical and trade name in the index.

The products listed are readily available in Manitoba. Products other than the ones listed in this publication can be used for plant disease control, as long as they are registered for use in Canada, and recommendations appear on the label for the use intended.

ANILAZINE

This is a broad spectrum protective foliar fungicide for use on turf grass to control dollar spot, leaf spot, melting out and brown patch.

BENOMYL

Benomyl is a systemic fungicide for use on snap beans, cucumbers, strawberries, tomatoes, turfgrass and ornamentals. A derivative of benomyl called carbendazim phosphate is sold as Lignasan BLP. Commercial applicators use it in treating elm trees for prevention and cure of Dutch Elm Disease.

Note: There have been reports of fungi developing resistance to benomyl, particularly gray mold. It is advisable, if benomyl is being used on a regular basis, to mix it with captan.

CAPTAN

Captan is registered for control of foliar and fruit diseases of fruit trees, strawberries and raspberries. It is also used as a seed treatment and drench to control soil borne disease organisms.

CHLOROTHALONIL

Chlorothalonil is a low toxicity, broad spectrum fungicide with protective action. It is registered for use on vegetables such as cucumbers, pumpkins, melons, squash, potatoes, carrots and tomatoes for control of anthracnose, downy mildew, powdery mildew, scab and early blight. Chlorothalonil can also be used on turf to control brown patch, dollar spot, melting out, and snow mold. It is also recommended for control of black spot of roses.

COPPER (FIXED)

Copper (fixed) is a broad spectrum fungicide and bactericide used for controlling foliar diseases caused by fungi and bacteria on beans, potatoes and some vegetables, ornamentals and fruit trees. Fixed copper fungicides can be used in most cases where Bordeaux mixture was formerly recommended. Copper compounds are also used as algicides and wood preservatives.

DICHLONE

This fungicide is available both as a pressurized aerosol product and an emulsifiable concentrate. It is used in combination with Dinocap for control of leaf spots and powdery mildew of roses, and other ornamentals. Dichlone is not registered for use on edible crops.

DINOCAP

Dinocap, although a short residual, is a good eradicant fungicide especially against powdery mildew. It also has some effect on mites. It is registered on apples, cucumbers (field and greenhouse), melons and squash, and woody herbaceous ornamentals (field and greenhouse). A mixture containing captan is registered as a domestic (home garden) fungicide for use on ornamentals, cucumber, melons, squash, apples and pears.

ETRIDIAZOLE

Etridiazole is a low toxicity, moderately residual soil fungicide. It specifically controls soil borne water molds Pythium and Phytophthora that cause crown and root rots of bedding plants (ornamentals only), foliage plants and greenhouse flowers, chrysanthemums and geraniums.

FERBAM

This general purpose, long lasting fungicide is used to control foliar diseases of fruit trees, raspberries, herbaceous and wood ornamentals. It is also used for damping-off of vegetables as a post-emergence drench. It is active against rust and gray mold, but not powdery mildew.

FOLPET

This broad spectrum fungicide has notable protectant action. It is used to control foliar and fruit diseases of fruit trees and strawberries, vegetables such as cucumbers, celery or tomatoes, and ornamentals including roses, geraniums and gladiolus. A mixture containing folpet and captan is registered for diseases of roses and on other ornamentals for control of powdery mildew and rose black spot.

MANEB

Maneb is a broad spectrum fungicide used in controlling diseases of vegetables and lawns. It has primarily protective action and must be used repetitively on a 7 to 10 day schedule to control diseases such as early blight of tomatoes and potatoes.

OXINE BENZOATE

This fungicide is used for controlling damping-off of bedding plants (ornamentals) and stem rot of cuttings.

SULPHUR COMPOUNDS (INCLUDING LIME SULPHUR)

Sulphur compounds also have some insecticide and miticide activity. Sulphur has only protective action. It is recommended for control of powdery mildew and rust of currants, beans, peas and ornamentals. Sulphur compounds may cause plant injury if applied in hot (28°C) dry weather.

Lime sulphur is a combination fungicide-insecticide (scales and mites) which is more injurious to plants than other sulphurs. Lime sulphur is normally applied only as a dormant or delayed dormancy spray for raspberries, currants, gooseberries, fruit trees, roses and other woody ornamentals. Application to green leaves may cause plant injury.

THIOPHANATE-METHYL

This systemic action fungicide is effective against powdery mildew. It is sold combined with captan for use on junipers, ornamentals, and roses for control of blackspot, blight and powdery mildew.

THIRAM

Thiram is used mainly in seed treatments for vegetables and bedding plants for control of seed rot and seedling blights.

TRIFORINE

Triforine, a foliar fungicide with some systemic activity, also has a protectant action. It is currently registered for control of powdery mildew and blackspot of roses and ornamentals. Triforine is available as an emulsifiable concentrate. This makes it particularly suitable for application in spray equipment which does not allow for agitation.

DOMESTIC FUNGICIDES AND REGISTRANTS *(In bold face)*

CHEMICAL NAME	TRADE NAME	FORMULATION
anilazine	Dyrene 50% Wettable Powder Foliar Fungicide **(CHEMAGRO)**	Wp
	Dyrene Turf Fungicide 50% Wettable Powder **(CHEMAGRO)**	Wp
benomyl	**LATER'S** Benomyl Systemic Fungicide	Wp
	WILSON'S Benomyl Systemic Fungicide	Wp
	PLANTCO Benomyl Systemic Fungicide	Wp
	C-I-L Fruit and Garden Fungicide (Systemic) **(CHIPMAN)**	Wp
captan	**CO-OP** Flower and Garden Dust	Du
	CO-OP Rose Dust Insecticide/Fungicide	Du
	CO-OP Tomato Dust	Du
	GREEN CROSS Rose Dust Insecticide/Fungicide **(CIBA-GEIGY)**	Du
	Captan 10 Wettable Powder **(CIBA-GEIGY)**	Wp
	LATER'S Bulb Dust	Du
	WILSON'S Tomato and Vegetable Dust	Du
	LATER'S Golden Garden Dust Insecticide/Fungicide	Du
	C-I-L Soil and Bulb Dust Insecticide/Fungicide **(CHIPMAN)**	Du
	GREEN CROSS Gardal Rose and Evergreen Dust **(CIBA-GEIGY)**	Du
	GREEN CROSS Soil and Bulb Dust	Du
	WILSON'S Bulb and Soil Dust	Du
	LATER'S Fruit Guard Fruit Tree and Berry Spray	Su
	C-I-L Fruit and Garden Fungicide (Systemic) **(CHIPMAN)**	Wp
	CO-OP Fruit and Shrub Dust or Spray Insecticide/Fungicide	Wp
	SCOTT'S Cure **(KIWI)**	Wp
	Fruit Plus Liquid Fruit — Tree Spray **(CHIPMAN)**	Su
	GREEN CROSS Multi-Purpose Flower and Vegetable Dust **(CIBA-GEIGY)**	Du
	GREEN CROSS Fruit Tree and Garden Spray **(CIBA-GEIGY)**	Wp

CHEMICAL NAME	TRADE NAME	FORMULATION
chlorothalonil	**C-I-L** Insecticide/Fungicide for Vegetables **(CHIPMAN)**	Wp
	C-I-L Lawn Fungicide **(CHIPMAN)**	Wp
	C-I-L Rose and Garden Fungicide **(CHIPMAN)**	Wp
	C-I-L Insecticide/Fungicide Liquid for Vegetable **(CHIPMAN)**	Sn
copper as elemental, present as a tribasic copper sulphate	**WILSON'S** Rose and Flower dust	Du
	WILSON'S Bordo Fungicide Spray	Wp
	C-I-L Deecop Insecticide/Fungicide for Vegetables **(CHIPMAN)**	Du
	Tomato and Potato Dust **(CIBA-GEIGY)**	Du
	WILSON'S Tomato and Vegetable Dust	Du
copper as elemental, present as copper oxychloride	**LATER'S** Potato and Tomato Dust	Du
	LATER'S Copper Spray W.P. Fungicide	Wp
cycloheximide	ActiDione P.M. Flower Fungicide **(NOR-AM)**	Wp
dichlone	**LATER'S** Gard-N-Aid Rose Spray	Ec
	LATER'S Rose and Flower Care	Ps
	Guard'N Pride Fruit Tree Spray **(CIBA-GEIGY)**	Wp
	Rose and Flower Guard **(CIBA-GEIGY)**	Ps
	Kerigard Insecticide/Fungicide Pressurized Spray **(CHIPMAN)**	Ps
dinocap plus related active compounds	Rose and Flower Guard **(CIBA-GEIGY)**	Ps
	Kerigard Insecticide/Fungicide Pressurized Spray **(CHIPMAN)**	Ps
	LATER'S Garden Fungicide	Wp
etridiazole	**WILSON'S** Roots Root Stimulator/Fungicide for Cuttings	Sn
	Truban Fungicide **(MALKINCKRODT)**	Wp
ferbam	**C-I-L** Insecticide/Fungicide for Fruit Trees **(CHIPMAN)**	Wp
folpet	**C-I-L** Rose Dust Insecticide/Fungicide **(CHIPMAN)**	Du
	WILSON'S Rose and Flower Spray	Ps
	LATER'S Phaltan Rose and Garden Fungicide	Wp
	C-I-L Insecticide/Fungicide for Roses and Flowers Floritect **(CHIPMAN)**	Su
	C-I-L Garden Dust Insecticide/Fungicide **(CHIPMAN)**	Wp
	LATER'S Fruit Guard Fruit Tree and Berry Spray	Su
oxine benzoate	No-Damp Fungicide for Damping Off **(PLANT PRODUCTS)**	Sn

CHEMICAL NAME	TRADE NAME	FORMULATION
maneb	**WILSON'S** Maneb Fungicide	Wp
sulphur	**CO-OP** Rose Dust Insecticide/Fungicide	Du
	SCOTT'S Cure **(KIWI)**	Wp
	GREEN CROSS Multi-Purpose Flower and Vegetable Dust **(CIBA-GEIGY)**	Du
	GREEN CROSS Rose Dust Insecticide/Fungicide **(CIBA-GEIGY)**	Du
	WILSON'S Garden Sulphur Insecticide/Fungicide	Sp
	SAFER'S Sulphur Dust	Du
sulphur, lime or polysulphide	**LATER'S** Lime Sulphur Fungicide Acaricide	Sn
	WILSON'S Liquid Lime Sulphur Insecticide/Fungicide	Sn
	Lime Sulphur **(CIBA-GEIGY)**	Sn
thiophanate-methyl	**GREEN CROSS** Gardal Rose and Evergreen Dust **(CIBA-GEIGY)**	Du
thiram	**WILSON'S** Seed-Treat Fungicide Dust	Du
triforine	**GREEN CROSS** Rose and Ornamental Fungicide (Funginex 6.5) **(CIBA-GEIGY)**	Ec

***Wp** = wettable powder*
***Du** = dust*
***Su** = suspension*
***Sn** = solution*
***Sp** = soluble powder*
***Ec** = emulsifiable concentrate*
***Ps** = pressurized spray*

Information is current to November, 1987 as supplied by Agriculture Canada Pesticide Directorate. Only fungicides registered for domestic products, suitable for home and garden use are listed.

The registrant or manufacturers of the pesticide are indicated in bold type.

FORMULATING COMPANIES' ADDRESSES

CHEMAGRO Ltd., 256 Britannia Rd., E., Mississauga, Ontario L4Z 1S6

CHIPMAN Inc., 400 Jones Rd., P.O. Box 9100, Stoneycreek, Ontario L8G 3Z1

CIBA-GEIGY Canada Ltd., 6860 Century Ave., Mississauga, Ontario L5N 2W5

INTERPROVINCIAL CO-OP Ltd., 5659 McAdam Rd., Unit A5, Mississauga, Ontario L4Z 1N4

KIWI, P.O. Box 1400, Station B, 1115 Guelph Line N., Burlington, Ontario L7P 4C5

NOR-AM Chemical Co., 3509 Silverside Rd., Box 7495, Wellington, Delaware 19803

PLANT PRODUCTS Co. Ltd., 314 Orenda Rd., Bramalea, Ontario L6T 1G1

SAFER Ltd., 455 Milner Ave., Unit 1, Scarborough, Ontario M1B 2K4

WILSON Laboratories Inc., 36 Head St., Dundas, Ontario
L9H 3H3

Only the companies known to sell pesticides in Manitoba are listed. A more complete listing is available from Agriculture Canada Pesticide Directorate.

Some of the products listed may contain an insecticide(s) in addition to fungicide(s) listed. Consult product label, for complete list of ingredients.

TABLE 1
RECOMMENDED FUNGICIDES FOR CONTROL OF PLANT DISEASES IN THE HOME GARDEN

| | PART "A" CROPS | | | | | | | | | | | | | | | | | | | PART "B" DISEASES | | | | | | | | | | | | | | | | | | |